

REMARKS

Claims 1, 4-13, 29, 31-38, 48, 50-54, 60, and 62-66 are pending in the application.

Claims 1, 4-13, 29, 31-38, 48, 50-54, 60, 62-66 have been rejected.

Claims 1, 5, 7, 8, 10-12, 29, 31-33, 35, 38, 48, 50-52, 54, 60, 62-64, and 66 have been amended. Support for these amendments is found at ¶¶ [0042]-[0043] of Applicants' Specification. No new matter is added.

Claims 72-75 have been added. Support for these claims is found at ¶¶ [0040], [0041], [0042], [0048], and [0051] of Applicants' Specification. No new matter is added.

Formal Matters

Appreciation is expressed for the telephonic interview conducted on November 24, 2009 between Examiner Elallam and Shawn Doman. During the interview, the Liu reference was discussed with reference to independent claim 1. The undersigned believes this paper is in harmony with the positions expressed during the interview.

Rejection of Claims under 35 U.S.C. §103(a)

Claims 1, 4-5, 8-10, 13, 29, 32-33, 36-38, 48, 51-52, 60 and 64 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Liu et al. (US Patent Publication No. 2002/0146016) ("Liu"). Applicants respectfully traverse this rejection.

Applicants respectfully submit that the cited portions of Liu fail to disclose each feature recited in claim 1. For example, in addition to a memory coupled to an output port of a network device, claim 1 recites a first queue and a second queue, wherein the first queue is coupled to the output port and the second queue is configured to store a copy a packet forwarded to the output port. Applicants respectfully submit that the cited portions of Liu fail to disclose these structures. The Office Action posits that Liu's cache 118 is comparable to the claimed memory and second queue. Office Action, p. 3. Applicants respectfully disagree.

The claimed second queue indicates how many packets in each of the flows are outstanding. The cited portions of Liu fail to disclose that Liu's cache provides such indication. The Office Action states that Liu impliedly discloses multiple flows within a

tunnel and that this, coupled with Liu's outbound packet counter, discloses the claimed act of "indicating how many packets in each of the flows are outstanding within the network tunnel." Office Action, p. 3. Applicants respectfully disagree. Clearly it is possible to count the number of packets in a tunnel that includes multiple flows without keeping track of how many packets are outstanding in each flow. In fact, keeping track of the number of packets without regard for which flows the packets belong to is a common feature of systems that do not perform flow control operations on a flow-by-flow basis. As noted in the Specification, such systems are unable to effectively target flow control operations to flows that actually contribute to congestion. That is, in such systems, packets are dropped in response to congestion without regard to the flow which originated the packets. This can lead to fragile, or low volume, flows being throttled back while high-volume flows which are more responsible for congestion are not throttled back. This shortcoming can be avoided using a queue, such as the claimed second queue, that indicates how many packets are outstanding for each flow in the tunnel. However, the cited portions of Liu fail to disclose such a queue.

Furthermore, Applicants respectfully submit that the cited sections of Liu fail to disclose that outputting a packet for transmission comprises removing the packet from a first queue and storing a copy of the packet in the second queue, as claimed. Applicants respectfully submit that this is unsurprising since the cited portions of Liu fail to disclose a first and second queue. The claimed configuration, where a packet is first stored in a queue coupled to an output port, and a copy is stored in a second queue when the packet is transmitted from the first queue, is not disclosed by the cited portions of Liu. For at least the foregoing reasons, Applicants respectfully request the Examiner's reconsideration and withdrawal of the rejections to claim 1, as well as claims 29, 48, 60 (which contain substantially similar features), as well as all claims that depend therefrom, and an indication of the allowability of same.

Regarding claim 5, Applicants respectfully submit the cited portions of Liu fail to disclose each feature of claim 5. For example, the Office Action fails to point to any portions of Liu (or any other reference) which purportedly disclose a loopback port or sending a copy of a packet to a loopback port or receiving a copy of a packet at a loopback port. The Office Action merely states that a packet "is implicitly sent to a waiting queue." Office Action, p. 4. Even if this were true (a point Applicants do not concede), sending a packet to a queue is not the same as sending a packet to a loopback

port, or storing a packet in response to the packet being received by a loopback port. Neither the Office Action nor the cited portions of Liu make any reference whatsoever to a loopback port. For at least the foregoing reasons, Applicants respectfully request the Examiner's reconsideration and withdrawal of the rejections to claim 5, as well as claims 31, 50, and 62 (which contain substantially similar features), and an indication of the allowability of same.

Claims 6 and 7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Liu in view of Le Gouriellec et al. (US Patent Publication No. 2003/0112756) (hereinafter "Le Gouriellec"). Applicants respectfully traverse this rejection.

Applicants respectfully submit that the cited portions of Liu and Le Gouriellec fail to disclose each feature of claims 6 and 7. Specifically, Applicants respectfully submit that the cited portions of Liu and Le Gouriellec fail to disclose selecting whether a particular packet is admitted to a network tunnel based on which flow comprises the packet, as recited in claim 6. The Office Action admits that Liu fails to disclose this feature and cites portions of Le Gouriellec as purportedly supplying this missing disclosure. Office Action, p. 9. The Office Action attempts to equate Le Gouriellec's system of discarding packets based on the flow profiles of the packets with the claimed tunnel admission restriction based on which flow a packet belongs to. *Id.* Applicants respectfully submit that the two are not comparable.

As an initial matter, Le Gouriellec discloses that the packets referred to as having different profiles actually belong to a single "inbound traffic flow." *See* Le Gouriellec ¶ [0008]. The fact that the cited portions of Le Gouriellec fail to disclose a plurality of flows, as claimed, renders it wholly unsurprising that the cited portions of Le Gouriellec fail to disclose basing tunnel admission decisions for a given packet based on which flow of a plurality of flows comprises the packet. Le Gouriellec discloses that various packets within a single flow are identified according to whether the packets are within certain bandwidth restrictions (first profile packets) or outside of those bandwidth restrictions (second profile packets). *See* Le Gouriellec ¶ [0025]. The cited portions of Le Gouriellec disclose that packets that are without the bandwidth restrictions can be summarily dropped or marked to be dropped in the event of congestion. *Id.* Thus, the cited portions of Le Gouriellec disclose that packets can be dropped based on whether they were sent in compliance with or in violation of the subscription bandwidth rules of the sending host.

However, the cited portions of Le Gouriellec do not disclose admitting packets to a tunnel based on which flow the packets are in, as claimed. Again, this makes sense since the cited portions of Le Gouriellec disclose that the packets are in the same flow.

Applicants respectfully submit that the cited portions of Liu and Le Gouriellec also fail to disclose deciding whether to admit a packet to the network tunnel based on the number of packets of a particular flow stored in the claimed second queue, as recited in claim 7. The Office Action cites portions of Le Gouriellec that disclose “if the filling level of the non-congestion area is above the congestion watermark, a congestion status is indicated causing all marked packets to be dropped and unmarked packets to be stored in the congestion area of the queue for transmitting via an output port 53 to a next hop on the LSP 30.” Le Gouriellec ¶ [0039] (cited at Office Action, p. 9). Again, Le Gouriellec fails to disclose multiple packet flows. Instead, the cited portions of Le Gouriellec disclose that if the network is congested, packets marked as having been sent in excess of a subscriber’s bandwidth are dropped. Packets are marked based on the number of packets in a single flow (whether the number is below or above a bandwidth restriction). *See* Le Gouriellec ¶ [0028]. The cited portions of Le Gouriellec do not disclose marking packets based on which flow of multiple flows comprises a packet. In fact, the cited portions of Le Gouriellec do not disclose any awareness at all of a plurality of flows. For at least the foregoing reasons, Applicants respectfully request the Examiner’s reconsideration and withdrawal of the rejections to claims 6 and 7 and an indication of the allowability of same.

Claims 11 and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Liu in view of Bishard (US Patent Publication No. 2003/0165148) (“Bishard”). Applicants respectfully traverse this rejection.

Applicants respectfully submit that the cited portions of Liu and Bishard fail to disclose each feature of claim 12. Specifically, Applicants respectfully submit that the cited portions of Liu and Bishard fail to disclose a network device configured to reduce the rate at which packets are removed from a queue if the usage of the queue exceeds a threshold level. The Office Action admits that Liu fails to disclose these features and cites portions of Bishard as purportedly providing this missing disclosure. Office Action, p. 10. However, the cited portions of Bishard disclose that as a first queue fills, the output rate of a second queue is reduced. *See* Bishard ¶ [0040] (cited at Office Action, p. 10).

Bishard discloses this is done so that more packets from the first queue can be transmitted. *See* Bishard ¶ [0041]. Thus, the manner of operation disclosed by the cited portions of Bishard is opposite of that recited in claim 12. That is, Bishard discloses that as the usage level of a first queue increases, the transmission rate of a second queue (which has lower priority) is reduced so the first queue can transmit more packets. *Id.* This is in direct contrast to claim 12, which recites that if the usage level of a first queue exceeds a threshold, the rate at which packets are removed from the first queue is reduced. For at least the foregoing reasons, Applicants respectfully request the Examiner's reconsideration and withdrawal of the rejections to claims 11 and 12 and an indication of the allowability of same.

Claims 34, 35, 53, 54, 65 and 66 are rejected under 35 U.S.C. §103(a) as being unpatentable over Liu in view of Brewer et al. (US Patent Publication No. 2006/0062233) ("Brewer"). Claims 31, 50, 62 and 63 are rejected under 35 U.S.C. §103(a) as being unpatentable over Liu in view of Banister (USPN 6,145,032) ("Banister"). Applicants respectfully traverse these rejections. For at least the foregoing reasons provided above with respect to the independent claims, Applicants respectfully request the Examiner's reconsideration and withdrawal of the rejections to these claims and an indication of the allowability of same.

Added Claims

Claims 72-75 have been added. Support for these claims is found at ¶¶ [0040], [0041], [0042], [0048], and [0051] of Applicants' Specification. No new matter is added.

Claim 74 clarifies that flow control can be performed on a per-flow basis. That is, the control unit is configured to drop packets from a particular flow when the particular flow is contributing to congestion in a tunnel. The Office Action cites portions of Liu as disclosing a packet counter, however, neither the cited portions of Liu or the Office Action discloses counting packets on a per-flow basis. Accordingly, claim 74, as well as the rest of the newly added claims, are patentable over the cited references for at least this reason as well as the reasons set forth above with respect to the independent claims.

CONCLUSION

In view of the amendments and remarks set forth herein, the application and the claims therein are believed to be in condition for allowance without any further examination and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at (512) 439-5092.

If any extensions of time under 37 C.F.R. § 1.136(a) are required in order for this submission to be considered timely, Applicants hereby petition for such extensions. Applicants also hereby authorize that any fees due for such extensions or any other fee associated with this submission, as specified in 37 C.F.R. § 1.16 or § 1.17, be charged to deposit account 502306.

Respectfully submitted,

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